EXHIBIT A

United States Court of Appeals for the Federal Circuit

GRACE INSTRUMENT INDUSTRIES, LLC,
Plaintiff-Appellant

v.

CHANDLER INSTRUMENTS COMPANY, LLC, AMETEK, INC.,
Defendants-Appellees

2021-2370

Appeal from the United States District Court for the Southern District of Texas in No. 4:20-cv-01749, Judge Andrew S. Hanen.

Decided: January 12, 2023

BRADFORD TURNER LANEY, Raley & Bowick, LLP, Houston, TX, argued for plaintiff-appellant. Also represented by ROBERT MCGEE BOWICK, JR.

JULIE S. GOLDEMBERG, Morgan, Lewis & Bockius LLP, Philadelphia, PA, argued for defendants-appellees. Also represented by EUGENE HWANGBO, JASON C. WHITE, Chicago, IL; ARCHIS VASANT OZARKAR, WILLIAM R. PETERSON, MELISSA MARIE STORY, Houston, TX.

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Before CHEN, CUNNINGHAM, and STARK, *Circuit Judges*.

CHEN, *Circuit Judge*.

Grace Instrument Industries, LLC (Grace) appeals a claim construction order issued by the United States District Court for the Southern District of Texas finding the term "enlarged chamber" indefinite and construing the term "means for driving said rotor to rotate located in at least one bottom section." As a result of the district court's order, the parties stipulated that asserted claims 1, 2, 4, 5, 7–9, 11, 14, 15, and 17 of U.S. Patent No. 7,412,877 ('877 patent) are invalid and that claims 4, 5, 7–9, 11, 14, 15, and 17 are not infringed, and the court entered final judgment in favor of Chandler Instruments Company, LLC (Chandler). Because the district court erred in its analysis of the term "enlarged chamber," we vacate the district court's determination that "enlarged chamber" is indefinite and remand for further proceedings consistent with this opinion. We affirm the district court's construction of "means for driving said rotor to rotate located in at least one bottom section."

BACKGROUND

I

When drilling oil wells, drilling fluid is used to drive a drill bit and bring drill cuttings back to the surface of the well. '877 patent col. 1 ll. 17–19. The drilling fluid's viscosity is critical to the well's operation—too high and the fluid is too hard to pump; too low and the fluid cannot carry the drill cuttings back to the surface. *Id.* at col. 1 ll. 19–24. Thus, before use, drilling fluid viscosity is first measured using a viscometer that simulates "down-hole" conditions—i.e., the temperature and pressure at the drill bit while drilling. *Id.* at col. 1 ll. 26–28.

In a liquid pressurized viscometer, pressurization fluid is added to pressurize the sample drilling fluid within the viscometer to down-hole conditions while the sample fluid

is stirred by a rotor to measure its viscosity. The introduction of the pressurization fluid compresses the sample drilling fluid, causing it to take up less volume within the viscometer. Ideally, the pressurization fluid does not mix with the sample fluid being measured to ensure that the viscometer reports the viscosity of only the sample fluid and not the viscosity of a mixture of the two fluids. *Id.* at col. 1 ll. 53–56, col 5 ll. 55–57, col. 5 ll. 59–62, col. 12 ll. 21–23.

Before the '877 patent, liquid pressurized viscometers separated the sample fluid from the pressurization fluid in one of two ways. Some viscometers relied on the density difference between the fluids, but if some pressurization fluid entered the chamber where the sample fluid was being tested, stirring by the rotor would cause the two fluids to mix, leading to measurement errors. *Id.* at col. 1 ll. 53–56, col. 5 ll. 59–62. Other viscometers used a seal to separate the two fluids, but friction caused by the sample fluid rubbing against the seal as the sample fluid was stirred led to inaccurate results. *Id.* at col. 1 ll. 43–46, col. 5 ll. 57–59.

The '877 patent's viscometer purportedly eliminates measurement errors caused by seal friction or commingling of sample and pressurization fluids by offering a different solution. *Id.* at col. 2 ll. 1–3, col. 12 ll. 21–23. Instead of using a seal to separate the fluids, the '877 patent's viscometer includes an "enlarged" chamber located between a lower chamber, housing the sample fluid, and a pressurization fluid inlet, located in the top section of the viscometer's pressure vessel. This enlarged chamber is large enough such that the level of the sample fluid, which before pressurization initially fills both the lower chamber and the enlarged chamber, never falls below the transition point between the lower chamber and enlarged chamber when the application of the pressurization fluid compresses the sample fluid. By keeping the sample fluid level above the top of the lower chamber and within the enlarged

chamber, even when the sample fluid is compressed, the claimed viscometer design ensures that any mixing between the two fluids occurs within the enlarged chamber and no pressurization fluid enters the lower chamber where the sample fluid is being tested. *Id.* at col. 5 l. 55 – col. 6 l. 6; *see also id.* at col. 8 ll. 37–48, col. 10 ll. 49–60. Thus, the '877 patent's design is intended to "[t]otally eliminate the measurement error because of sample mixing with pressurization fluid in a comparative viscometer." *Id.* at col. 12 ll. 21–23.

The '877 patent discloses three embodiments of its viscometer. The first embodiment is shown below.

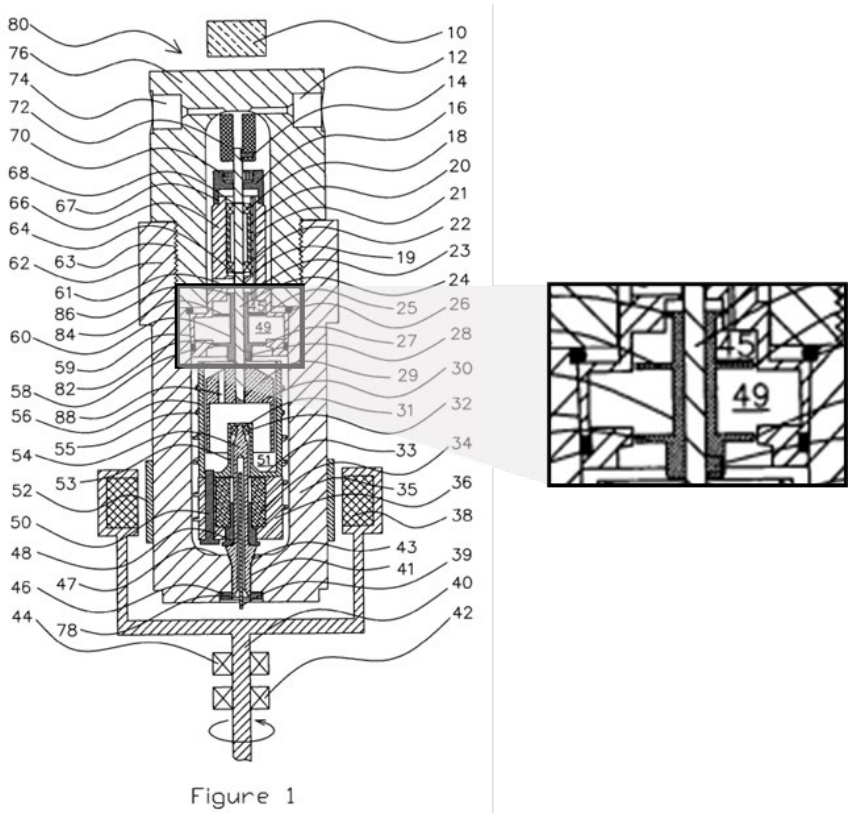

Figure 1

Id. FIG. 1 (exploding out chambers 45 and 49); *see also id.* FIG. 2, FIG. 3. In each embodiment, chambers 45 and 49

act together to contain the pressurization fluid as the sample fluid in a "lower measurement zone" is compressed:

> [W]hen pressurization fluid is applied, the sample fluid level is pushed down due to the compressibility of tested sample. Thus initial sample fluid inside of chamber 45 goes down to chamber 49 through small gap 25, and some of the initial sample fluid inside of chamber 49 goes down to the lower measurement zone through small gap 27. However, chamber 45 and chamber 49 are large enough so that at maximum rated pressure, chamber 49 is still at least half filled with sample fluid. This ensures the accuracy of the measurement because measurement zone below anti mixer bottom fin 82 is always totally filled with sample fluid.

Id. at col. 5 l. 63 – col. 6 l. 6; *see also id.* at col. 8 ll. 37–48, col. 10 ll. 49–60. Although the three embodiments use both chamber 45 and chamber 49, the '877 patent also explains that "[i]t is not necessary to have both chamber 45 and chamber 49." *Id.* at col. 10 ll. 64–65. "With just chamber 45 *or* chamber 49 and sufficient volume, pressurization fluid and test sample can still be separated well." *Id.* at col. 10 ll. 65–67 (emphasis added).

To measure the viscosity of the sample fluid in the lower measurement zone, the '877 patent discloses a rotor that is driven by magnetic coupling but also "could be driven to rotate with any means such as directly driven at the bottom of the cell body with dynamic seal, etc." *Id.* at col. 2 ll. 11–13, col. 4 ll. 54–59, col. 5 ll. 42–54, col. 7 ll. 41–47, col. 8 ll. 24–36, col. 9 ll. 61–67, col. 10 ll. 36–48, col. 11 ll. 41–43.

Claims 1 and 4 are independent claims that claim a pressurized device and a viscometer, respectively:

1. A pressurized device comprising:

(a) a pressure vessel within which is vertically disposed at least one top section filled with a pressurization fluid of a first density and at least one lower section filled with a test sample of a second density,

(b) an *enlarged chamber* with reduced openings positioned between the at least one top section and the at least one bottom section for communicating pressure with said top section and said lower section within said pressure vessel,

(c) whereby said pressurization fluid would not mix with said test sample because of the nature of their density difference.

4. Viscometer comprising:

(a) a pressure vessel within which at least one top section filled with a pressurization fluid of a first density,

(b) within said pressure vessel a rotor which is driven to rotate while contacting with a sample liquid of a second density to be measured,

(c) *means for driving said rotor to rotate located in at least one bottom section*,

(d) a bob within said rotor,

(e) an *enlarged chamber* with reduced openings positioned between the at least one top section and the at least one bottom section for communicating pressure located above said bob,

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> (f) whereby said pressurization fluid would not mix with said sample liquid because of the nature of their density difference.

Id. at col. 12 ll. 34–47, col. 12 ll. 52–67 (emphases added). The two italicized claim terms are the focus of this appeal.

II

On May 19, 2020, Grace sued Chandler in the United States District Court for the Southern District of Texas, alleging that Chandler's Model 7600 viscometer infringed multiple claims of the '877 patent. J.A. 52; J.A. 61–65. On July 1, 2021, the district court issued its claim construction order. *Grace Instrument Indus., LLC v. Chandler Instruments Co.*, No. 4:20-cv-1749, 2021 WL 2711987 (S.D. Tex. July 1, 2021) (*Claim Construction Order*).

Relevant here, the district court held that the term "enlarged chamber" in claims 1 and 4 is indefinite. *Id.* at *4–5. The district court explained that "enlarged" is a "term of degree" that "necessarily calls for some comparison against some baseline." *Id.* at *5 (quoting *Liberty Ammunition, Inc. v. United States*, 835 F.3d 1388, 1395 (Fed. Cir. 2016)). Finding that the '877 patent "does not provide the requisite objective boundaries" for a skilled artisan, the district court held that "enlarged chamber" is indefinite. *Id.* at *5. The district court rejected Grace's argument that "enlarged chamber" could be defined by its purpose, finding that "explaining that something is *large enough* to do a certain task does not answer the question: *larger than what?*" *Id.* The district court further disagreed with Grace that the baseline for "enlarged" is the prior art, explaining that "this is not evident from the '877 Patent itself." *Id.*

The district court also construed "means for driving said rotor to rotate located in at least one bottom section." *Id.* at *7–8. The parties agreed that the term was subject to 35 U.S.C. § 112, ¶ 6 (pre-AIA), and the table below illustrates the parties' positions on the construction:

Grace's proposed construction	Chandler's proposed construction
Function: driving a rotor to rotate. Means: motor or gearbox and equivalent structures.	Function: driving said rotor to rotate, where the means for driving is located in at least one bottom section. Means: (i) magnetic coupling (magnet mount, gear box or motor, driving magnet, coupling magnet), or (ii) direct drive at bottom of cell body, and known equivalents.

Id. at *7; J.A. 34. The parties thus agreed that the function is "driving said rotor to rotate," but they disputed the means and whether the phrase "located in at least one bottom section" modifies "rotor," as Grace contended, or "means for driving," as Chandler argued. *Claim Construction Order*, 2021 WL 2711987, at *7.

To resolve the dispute, the district court looked to claim 14, which depends from claim 4 and recites:

> 14. The viscometer of claim 4 wherein said means for driving said rotor to rotate is a magnetic coupling across said pressure vessel wall.

'877 patent col. 13 ll. 22–24. The district court found that Grace's proposed construction of the means (1) was "not broad enough to include magnetic coupling" as it must because of dependent claim 14 and (2) would exclude other terms described in the patent as causing the rotor to rotate. *Claim Construction Order*, 2021 WL 2711987, at *7 (citing '877 patent col. 5 ll. 45–47 (magnet mount), col. 4 ll. 55–59 (gear box, motor, driving magnet, or coupling magnet), col. 12 ll. 41–43 (direct drive at bottom of the cell body)). Thus, the district court adopted Chandler's proposed construction of the means.

The district court also agreed with Chandler that "located in at least one bottom section" modifies "means for driving," not "rotor." *Id.* at *8. The district court explained that this interpretation "conform[s] with [the] usual rules of grammar and sentence structure" and is confirmed by limitation 4(b), which already describes the rotor's location

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as "within said pressure vessel," not necessarily in the "bottom section." *Id.*

Thus, the district court adopted in its entirety Chandler's proposed construction of "means for driving said rotor to rotate located in at least one bottom section." *Id.* Accordingly, the function of the "means for driving" limitation is "driving said rotor to rotate, where the means for driving is located in at least one bottom section," and the corresponding structure is "(i) magnetic coupling (magnetic mount, gear box or motor, driving magnet, coupling magnet), or (ii) direct drive at bottom of cell body, and known equivalents." *Id.* at *7–8.

The parties then stipulated that claims 1, 2, 4, 5, 7–9, 11, 14, 15, and 17 are invalid based on the district court's determination that "enlarged chamber" is indefinite, and that claims 4, 5, 7–9, 11, 14, 15, and 17 are not infringed based on the district court's construction of "means for driving said rotor to rotate in at least one bottom section." J.A. 1529–34. The district court entered a final judgment on September 23, 2021. J.A. 19–20.

Grace timely appealed. We have jurisdiction under 28 U.S.C. §§ 1291 and 1295(a)(1).

DISCUSSION

Claim construction requires determining how a skilled artisan would understand a claim term "in the context of the entire patent, including the specification." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). We begin by considering the language of the claims themselves. *Id.* at 1314. However, "claims must be read in view of the specification, of which they are a part." *Id.* at 1315 (internal quotation marks omitted) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995) (en banc)). We have explained that the specification is the "single best guide to the meaning of a disputed term," *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582

(Fed. Cir. 1996), and "is, thus, the primary basis for construing the claims," *Phillips*, 415 F.3d at 1315 (citation and internal quotation marks omitted). A court also should consider the patent's prosecution history, and may rely on dictionary definitions, "so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents." *Id.* at 1317, 1322–23 (citation and internal quotation marks omitted).

We review claim construction based on intrinsic evidence de novo and review any findings of fact regarding extrinsic evidence for clear error. *SpeedTrack, Inc. v. Amazon.com, Inc.*, 998 F.3d 1373, 1378 (Fed. Cir. 2021) (citing *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331–32 (2015)). Intrinsic evidence includes the patent's claims, specification, and prosecution history. *Cont'l Cirs. LLC v. Intel Corp.*, 915 F.3d 788, 795 (Fed. Cir. 2019). Extrinsic evidence is "secondary to the intrinsic evidence" and "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Id.* at 799 (quoting *Phillips,* 415 F.3d at 1317). "If the meaning of a claim term is clear from the intrinsic evidence, there is no reason to resort to extrinsic evidence." *Seabed Geosolutions (US) Inc. v. Magseis FF LLC*, 8 F.4th 1285, 1287 (Fed. Cir. 2021).

A "patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). "The ultimate conclusion that a claim is indefinite under 35 U.S.C. § 112, ¶ 2 is a legal conclusion, which we review de novo." *Cox Commc'ns, Inc. v. Sprint Commc'n Co.*, 838 F.3d 1224, 1228 (Fed. Cir. 2016) (citation omitted). "As in claim construction, we review a district court's underlying factual determinations for clear error." *Id.* (citations omitted). Moreover, "[a]ny fact critical to a holding on indefiniteness . . . must be proven by the

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challenger by clear and convincing evidence." *Id.* (alteration in original) (citation and internal quotation marks omitted).

I. Enlarged Chamber

Grace argued before the district court that the term "enlarged chamber" should be construed as "the area between reduced openings that is large enough to hold excess test sample (i.e., the type of fluid normally used in these machines) to prevent mixing of pressurization fluid and test sample below the bottom fin during elevated pressurization." *Claim Construction Order*, 2021 WL 2711987, at *5. The district court declined to adopt that construction, concluding that the '877 patent fails to disclose objective boundaries for a skilled artisan to know what the claimed "enlarged chamber" must be larger than. *Id.* This was error. The intrinsic record informs a skilled artisan that the '877 patent and its claims are directed to a viscometer with an "enlarged chamber" that is large enough to prevent pressurization fluid from entering the lower section of the pressure vessel—where the viscosity of the test sample is being measured—during elevated pressurization. In other words, the enlarged chamber has to be able to contain enough sample fluid at the pre-pressurization stage such that, during pressurization, the sample fluid level does not fall below the bottom of the enlarged chamber and into the viscometer's lower, testing section. This design ensures that any mixing of the pressurization fluid and compressed sample fluid occurs within the enlarged chamber and not in the lower, testing section. Thus, in the context of this patent, "enlarged chamber" does not require that chamber to be *larger than* some baseline object; rather it must be *large enough* to accomplish a particular function.

The '877 patent's specification guides us to the term's meaning. The specification explains that "[o]ne of the drawbacks of most liquid pressurized viscometers is the mixing between tested sample and pressurization fluid,"

which leads to inaccurate test results. '877 patent col. 5 ll. 55–57, col. 5 ll. 59–62; *see also id.* at col. 1 ll. 53–56. According to the patent, prior art viscometers attempted to remedy this inaccuracy by using a seal between the pressurization fluid and sample fluid, but the seal "induce[s] friction error causing inaccurate measurement." *Id.* at col. 5 ll. 57–59; *see also id.* at col. 1 ll. 43–46; discussion *supra* Background § I. The '877 patent explains that the "current invention" solves this problem through use of chambers 45 and 49: "[C]hamber 45 and chamber 49 are *large enough* so that at maximum rated pressure, chamber 49 is *still at least half filled* with sample fluid. *This ensures the accuracy of the measurement because measurement zone below anti mixer bottom fin 82 is always totally filled with sample fluid*." '877 patent col. 6 ll. 2–6 (emphases added). The patent discloses the same for two other embodiments, *id.* at col. 8 ll. 43–48, col. 10 ll. 55–60, and explains that a single chamber could be used instead of two chambers (i.e., chamber 45 and chamber 49), provided the single chamber has "sufficient volume," *id.* at col. 10 ll. 64–67. Finally, the specification explains that "[b]y providing an *enlarged chamber* such as chamber 45 or chamber 49 . . . this configuration can be applied to other applications than viscometers to reduc[e] the mixing of test sample and pressurization fluid." *Id.* at col. 11 ll. 28–32 (emphasis added). A skilled artisan would understand from these disclosures that the "enlarged chamber" comprises chambers 45 and/or 49 and is large enough to prevent the pressurization fluid from mixing with the sample fluid in the lower measurement zone during elevated pressurization, thus avoiding measurement errors caused by commingling of the sample and pressurization fluids in prior-art viscometers.

The prosecution history supports this understanding. In response to a rejection over U.S. Patent No. 4,633,708 (Blommaert), which taught use of a seal, the applicant explained "[b]y having 'an enlarged chamber with reduced

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openings for communicating pressure', pressurization oil will not contaminate [the] test sample even without a seal as described in Blommaert." J.A. 1063; *see also* J.A. 1066–67, 1069–70. The applicant also explained that the "[c]urrent invention solved a long lasting problem" in high-pressure testing of drilling fluids, including "the large measurement error . . . induced due to the friction of the seal" in designs like Blommaert. J.A. 1062–63; *see also* J.A. 1064, 1066, 1068, 1070. The examiner subsequently allowed the claims. A skilled artisan would understand from the prosecution history that the purpose and role of the '877 patent's "enlarged chamber" is to prevent commingling of the sample and pressurization fluids in the lower measurement zone without using a seal, thereby avoiding the measurement errors seen in prior-art viscometers like Blommaert.

Thus, although "enlarged chamber" is not a term of art, the intrinsic record sufficiently guides a skilled artisan to the meaning of that term as used in the '877 patent. The district court erred in its reliance on extrinsic evidence—i.e., dictionary definitions—that contradict the scope and meaning of "enlarged chamber" that a skilled artisan would ascertain by reading the intrinsic record. *See Phillips*, 415 F.3d at 1322–23; *see also id.* at 1316 ("[O]ur cases recognize that the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess."); *Trs. of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1363 (Fed. Cir. 2016) ("The only meaning that matters in claim construction is the meaning in the context of the patent."). Where the specification instructs as to the meaning of a claim term, "the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316.

Chandler, for its part, is correct that the '877 patent's specification refers to "enlarged chamber" only twice, but, for the reasons already stated, a skilled artisan would understand that the specification's descriptions of an

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enlarged chamber and the corresponding embodiments adequately guide the skilled artisan to the meaning of "enlarged chamber." Further, to the extent Chandler would require an explicit definition of the term "enlarged chamber," that is incorrect. As our en banc opinion in *Phillips* explained, a "claim term may be clearly redefined without an explicit statement of redefinition," and "[e]ven when guidance is not provided in explicit definitional format, the specification may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents." 415 F.3d at 1320–21 (first quoting *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1268 (Fed. Cir. 2001); and then quoting *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004)); *see also Aventis Pharma S.A. v. Hospira, Inc.*, 675 F.3d 1324, 1330 (Fed. Cir. 2012) ("This clear expression need not be in haec verba but may be inferred from clear limiting descriptions of the invention in the specification or prosecution history.").

The district court's reliance on dictionary definitions of "enlarged" rather than the meaning a skilled artisan would reasonably understand from the intrinsic record led, in part, to its reliance on *Liberty Ammunition*. There, we found that "reduced area of contact" must be compared to the prior-art ammunition because there was no other objective boundary for a skilled artisan. *Liberty Ammunition*, 835 F.3d at 1396–97 (citing *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370–71 (Fed. Cir. 2014)). Here, however, the intrinsic record provides an objective boundary for a skilled artisan—i.e., the "enlarged chamber" must be large enough to prevent, during elevated pressurization, commingling of sample and pressurization fluids in the lower measurement zone. Unlike *Liberty Ammunition*, this objective boundary does not require a comparison to the size of prior-art chambers.

Our decision in *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374 (Fed. Cir. 2015), is more applicable.

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There, we reviewed claims directed to a heart rate monitor with a "spaced relationship" between a first live electrode and a first common electrode. *Id.* at 1376. We explained that, although the patent "does not specifically define 'spaced relationship' with actual parameters," the intrinsic evidence demonstrated that a "skilled artisan would be able to determine this language requires the spaced relationship to be neither infinitesimally small nor greater than the user's hands":

> For example, on the one hand, the distance between the live electrode and the common electrode cannot be greater than the width of a user's hands because claim 1 requires the live and common electrodes to independently detect electrical signals at two distinct points of a hand. On the other hand, it is not feasible that the distance between the live and common electrodes be infinitesimally small, effectively merging the live and common electrodes into a single electrode with one detection point.

Id. at 1382–83 (quoting *Biosig Instruments, Inc. v. Nautilus, Inc.*, 715 F.3d 891, 899 (Fed. Cir. 2013), *vacated sub nom. Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898 (2014)). Thus, we found that "a skilled artisan would understand the inherent parameters of the invention as provided in the intrinsic evidence." *Id.* at 1384. The same is true here. A skilled artisan would understand the inherent parameters of the "enlarged chamber" through the intrinsic evidence. Like the spaced relationship in *Nautilus*, the "enlarged chamber" must be a certain minimum size, or large enough, to maintain sample fluid within the enlarged chamber when the sample fluid is under elevated pressurization.

Although we disagree with the district court's conclusion that "enlarged chamber" must be *larger than* something else rather than *large enough* to achieve a particular purpose, it appears that the indefiniteness question is not

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yet fully resolved and may require further fact finding on remand. Chandler, for example, argues that the term "enlarged chamber" is still indefinite because the claims recite an additional limitation that relies on the "density difference" between the fluids—not the enlarged chamber—to prevent mixing. Appellee's Br. 20–22, 32–33. Chandler also argues that different sample fluids will compress in different amounts under the same pressure, and thus a skilled artisan cannot determine if a given viscometer's chamber satisfies the "enlarged chamber" limitation due to the variance in how much different sample fluids compress. Appellee's Br. 23–25, 32–33; *see also* Appellee's Letter, Aug. 8, 2022, ECF No. 50. Grace disagrees with the merits of both arguments and asserts that both arguments are waived because they were not raised before the district court. Appellant's Reply Br. 4–7, 15–19; Appellant's Letter, Aug. 11, 2022, ECF No. 53. Grace also makes additional arguments based on the extrinsic record. Appellant's Br. 45–54. We will not address these arguments in the first instance. It is appropriate for the district court to consider these types of arguments on remand, including whether any have been waived. We also note that the district court made no finding as to the identity of the pertinent person of ordinary skill in the art, from whose perspective the "reasonable certainty" analysis must be undertaken. This oversight may well be due to the parties' relative inattention to this factual issue, although the resolution of it may also be informative as to whether, on remand, the claims are again determined to be indefinite. *See generally Nautilus*, 572 U.S. at 901.

In sum, we find the term "enlarged chamber" in the '877 patent to mean "a chamber that is large enough to contain excess test sample prior to pressurization to prevent mixing of the test sample and pressurization fluid in the lower measurement zone when the test sample is pressurized to maximum rated pressure." We thus vacate the district court's determination that "enlarged chamber" is

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indefinite, vacate the district court's invalidity determinations based thereon, and remand for further proceedings consistent with this opinion.

II. Means for Driving Said Rotor to Rotate Located in at Least One Bottom Section

Grace also contests the district court's construction of "means for driving said rotor to rotate located in at least one bottom section." Grace argues that the court erred in finding that the term "bottom section" refers to the bottom section of the viscometer rather than the bottom section of the pressure vessel and in finding that "located in at least one bottom section" modifies "means for driving" rather than "rotor." Appellant's Br. 57–68, 70–71. According to Grace, the correct construction of "means for driving" includes a "magnet holder" and a "direct drive" that attaches to the bottom section of the rotor rather than "at bottom of cell body." Appellant's Br. 67–69. We disagree and thus affirm the district court's construction.

A. The District Court's Construction

We first consider whether the phrase "located in at least one bottom section" in limitation 4(c) modifies "means for driving" or "rotor." Starting with the claim language, we agree with the district court that the most natural reading of limitation 4(c) requires the phrase "located in at least one bottom section" to modify "means for driving" and not "rotor." In this limitation, "means" is a noun modified by the prepositional phrase "for driving said rotor to rotate." The noun "means" also is modified by the participle phrase "located in at least one bottom section." Because the prepositional phrase is unnecessary, the sentence is best read as a "means" that is "located in at least one bottom section." Had the patentee intended for "located in at least one bottom section" to modify "rotor," the patentee would have placed the "located in at least one bottom section" phrase before "to rotate."

That "means for driving said rotor to rotate" should be read as a unit, composed of a noun modified by a prepositional phrase, is confirmed by dependent claim 14. Claim 14 recites the viscometer of claim 4 "where said *means for driving said rotor to rotate* is . . . ." '877 patent col. 13 ll. 23–24 (emphasis added). Thus, in claim 14, the same noun modified by the same prepositional phrase is used in the same manner as in claim 4, indicating that the patentee intended the noun and prepositional phrase to be read together. Thus, "located in at least one bottom section" modifies the entire "means" unit and not the "rotor."

Comparing limitations 4(b) and 4(c) supports this interpretation. Limitation 4(b) introduces the "rotor" and explains that the rotor is located "within said pressure vessel." *Id.* at col. 12 ll. 55–57. Limitation 4(c) introduces the "means for driving" and explains that the "means for driving" is "located in at least one bottom section." *Id.* at col. 12 ll. 58–59. A skilled artisan reading claim 4 would understand that these limitations are directed to different components of the viscometer and also describe the corresponding locations for those components. Indeed, it would make little sense for limitation 4(b) to introduce the rotor, explain that it is located in the pressure vessel, and then, in a separate limitation directed to the "means for driving," explain that the rotor is located in the bottom section.

Next, we agree with the district court that the intrinsic record requires that the claimed "bottom section" refers to the bottom section of claim 4's viscometer, not the pressure vessel component of the viscometer. Dependent claim 14 explains that the "means for driving" is a "magnetic coupling *across* said pressure vessel wall." *Id.* at col. 13 ll. 23–25 (emphasis added). The "means for driving" thus cannot be *in* the bottom section of the pressure vessel because claim 14 requires the "means for driving" to operate *across* the pressure vessel wall—i.e., magnetic coupling components must be located inside and outside the pressure vessel. Thus, the "means for driving" must be in the

"bottom section" of the overall viscometer rather than the pressure vessel because that understanding encompasses the "means for driving" components located outside the pressure vessel.

The structure of claim 4 is consistent with this interpretation. Claim 4 is directed to a "Viscometer." *Id.* at col. 12 l. 52. Limitations 4(a) and 4(b), however, are specifically tailored to aspects of the pressure vessel within the viscometer, whereas limitation 4(c) does not refer to the "pressure vessel." *Id.* at col. 12 ll. 58–59. Reading these limitations together, a skilled artisan would interpret limitations 4(a) and 4(b) to refer to the pressure vessel and limitation 4(c) to refer to the "bottom section" the viscometer.

This reading also is consistent with the specification, which explains that the primary "means for driving" the rotor is magnetic coupling: "A motor or gearbox drives magnet mount 40 to rotate carrying driving magnet 38 . . . . Due to the magnetic coupling between driving magnet 38 and coupling magnet 34, rotor 51 rotates at the same revolving speed as magnet mount 40 does." *Id.* at col. 5 ll. 42–47; *see also id.* at col. 8 ll. 24–30, col. 10 ll. 36–42. The motor or gearbox, magnet mount 40, and driving magnet 38 are located outside the pressure vessel. *See id.* at FIGS. 1–3, col. 3 ll. 7–10. Because some of these components are *outside* the pressure vessel, they cannot be located *in* the bottom section of the pressure vessel. Instead, these components must be located in the bottom section of the viscometer.

Grace's remaining arguments are unpersuasive. Grace argues that "top section" of the pressure vessel in limitation 4(a) means that "bottom section" in limitation 4(e) refers to the pressure vessel, and "top section" and "bottom section" in limitation 4(e) must both refer to the pressure vessel to facilitate communicating pressure between the two. Appellant's Br. 58–59; Appellant's Reply Br. 31. We

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disagree. Limitation 4(e), consistent with our analysis above, can be understood as simply requiring that the enlarged chamber be positioned between the top section of the pressure vessel and bottom section of the viscometer.

Grace also argues that the district court's interpretation of "means for driving" to include "magnetic coupling (magnet mount, gear box or motor, driving magnet, coupling magnet)" (1) excludes the patent's preferred embodiments because certain components are outside of the pressure vessel and thus can cannot be located in the "bottom section," Appellant's Br. 63–65; (2) renders claim 14 impossible by requiring the magnetic coupling to be inside the pressure vessel's bottom section, Appellant's Br. 65–66; and (3) requires the electric motor to be inside the pressurized bottom of the pressure vessel, even though a motor cannot work while submerged in drilling fluid, Appellant's Br. 66–67. But for all of these arguments, Grace's logic is circular. Each argument relies on Grace's preferred interpretation that "bottom section" refers to the pressure vessel, not the viscometer. Under the correct interpretation that "bottom section" refers to the viscometer, the preferred embodiments are not excluded and there is no conflict with claim 14.

Finally, Grace relies on claim 1 and a stipulation between the parties to argue that the '877 patent uses the terms "lower section" and "bottom section" interchangeably to refer to the bottom section of the pressure vessel. Appellant's Br. 60 (citing J.A. 1297). We disagree. The stipulation Grace cites only modifies claim 1, not claim 4, and only changes "bottom section" in claim 1 to "lower section" to address the lack of antecedent basis. Appellee's Br. 50–51. Additionally, when Chandler argued at the *Markman* hearing that "lower section" in claim 1 refers to the pressurized device and "bottom section" in claim 4 refers to the viscometer, J.A. 1479–80 (75:8–76:10), Grace's counsel asked the agreement to be withdrawn because Grace did not intend for the stipulation to be used against it in relation to

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claim 4, J.A. 1489 (85:13–23). The stipulation thus does not make clear that the terms "lower section" and "bottom section" are used interchangeably in the '877 patent, and we are not persuaded that the patentee intended the terms to be interchangeable.

For the foregoing reasons, we affirm the district court's construction of "means for driving said rotor to rotate located in at least one bottom section."

B. Grace's Proposed Construction

We also reject Grace's proposed alternate construction for the means for driving limitation. Grace's proposed construction comprises two parts: (1) "means for driving" can be just the "magnet holder" alone because the magnet holder individually qualifies as a "means for driving," Appellant's Br. 67–68, Appellant's Reply Br. 22–28; and (2) the "direct drive" alternative to magnetic coupling as the "means for driving" should be construed such that it "attaches in the bottom section to the rotor to rotate it," rather than "at the bottom of the cell body," Appellant's Br. 69. We disagree.

1. Magnet Holder

Grace asserts that every structure involved in relaying power to the rotor individually qualifies as a separate "means for driving." *See* Appellant's Reply Br. 26. But Grace misreads the specification. *See, e.g.*, '877 patent col. 5 ll. 42–47; *see also id.* at col. 8 ll. 24–30, col. 10 ll. 36–42. The specification provides no details suggesting that the magnet holder, for example, could be solely responsible, without additional structure, for rotating the rotor. The other magnetic coupling components also are required to rotate the rotor.

Grace's argument that its interpretation prevents excluding the preferred embodiments is, again, circular. The district court's interpretation of "means for driving" only excludes the preferred embodiments if the claimed "bottom

section" refers to the pressure vessel, not the viscometer. But because we have determined that "bottom section" refers to the bottom section of the viscometer, the other components involved in the magnetic coupling "means for driving" may be located inside or outside the pressure vessel. *See* discussion *supra* Discussion § II.A. We thus disagree with Grace's attempt to define the "means for driving" as any individual component that relays power to the rotor.

2. Direct Drive

Grace argues that the district court erred in reading a limitation from the written description into the means for driving limitation by requiring the "direct drive" to be "at bottom of cell body." Appellant's Br. 69. Grace argues that means-plus-function claims must be limited to disclosed structures and equivalents, not locations of disclosed structures. Appellant's Reply Br. 31–32. We disagree.

The '877 patent explains that magnetic coupling can be used to drive the rotor to rotate, or the rotor "could be driven to rotate with any means such as *directly driven at the bottom of the cell body* with dynamic seal, etc." '877 patent col. 11 ll. 41–43 (emphasis added). The disclosed structure is, therefore, magnetic coupling or a direct drive at the bottom of the cell body, and known equivalents, consistent with the district court's opinion. *See Claim Construction Order*, 2021 WL 2711987, at *7–8. We reject Grace's attempt to disassociate the disclosed structure from the location of the disclosed structure. The specification indicates that the invention envisioned and claimed by the patentee was a direct drive attached to the bottom of the cell body. *See, e.g.*, *NOMOS Corp. v. BrainLAB USA, Inc.*, 357 F.3d 1364, 1367–68 (Fed. Cir. 2004) (affirming the district court's construction of a "means for generating at least one ultrasound image" as requiring the ultrasound probe to be mounted to the treatment table by a fixation device).

CONCLUSION

We have considered Grace's remaining arguments and do not find them persuasive. For the foregoing reasons, we vacate the district court's determination that "enlarged chamber" is indefinite, vacate the district court's invalidity determinations based thereon, and remand for further proceedings consistent with this opinion. We affirm the district court's construction of "means for driving said rotor to rotate located in at least one bottom section" and the district court's judgment based thereon.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

No costs.